

AL NA170-70-498
1992

MARSH RESTORATION
Dauphin Island
Sea Lab
Dauphin Island, AL.

GB625.A2M37 1992



A Cooperative Project of:

*Coastal Programs, Alabama Department of
Economic & Community Affairs*

Marine Environmental Sciences Consortium

*Office of Ocean & Coastal Resources Management,
National Oceanic & Atmospheric Administration*

MARSH RESTORATION: DAUPHIN ISLAND, ALABAMA

A COOPERATIVE PROJECT OF:

COASTAL PROGRAMS, ALABAMA DEPARTMENT OF ECONOMIC &
COMMUNITY AFFAIRS

MARINE ENVIRONMENTAL SCIENCES CONSORTIUM

OFFICE OF OCEAN & COASTAL RESOURCES MANAGEMENT,
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

US Department of Commerce
NOAA Coastal Resources Center Library
2234 Ocean Avenue
Charleston, SC 29405-2413

Financial assistance for this report provided
in part by the Coastal Zone Management Act
of 1972, as amended, administered by the
Office of Ocean & Coastal Resources
Management, National Oceanic & Atmospheric
Administration.



FINAL REPORT
MARSH RESTORATIONS: DAUPHIN ISLAND, ALABAMA

INTRODUCTION

The U.S. Fish and Wildlife Service has estimated that 30-40% of the original wetlands in the United States have been lost and that destruction continues at 300-400,000 acres per year (Tiner, 1984). Roach et al. (1987) documented a 35% loss of Alabama salt and brackish marshes in the 25 year period, 1955 to 1979. Growing concerns for maintenance of these critical natural resources have produced a national policy of "No net loss of wetlands." Approaches to meet this goal include wetlands preservation accompanied by restoration of degraded wetlands and creation of new wetlands. In a recent U.S. EPA report on the status and needs of wetland creation and restoration (Kusler and Kentula 1989), conclusions included:

1. Restoration should be favored over creation.
2. Restoration/creation efforts should be designed to be self-sustaining systems and "persistent" features in the landscape.
3. The greatest potential for filling gaps in scientific knowledge lie in careful monitoring of selected projects.
4. Standardized methods for project evaluation and project monitoring are needed to facilitate determination of "success" and comparisons between systems.
5. Wetland demonstration projects offer the greatest "control" and have the greatest potential for answering research questions and providing the know-how for restoration of systems already degraded as well as for reducing future impacts.

The Marine Environmental Sciences Consortium (MESC) operates the Dauphin Island Sea Lab (DISL) as the key facility for marine education and research in Alabama. A primary focus of the Sea Lab research program has been to address environmental questions of local and regional significance. Of particular importance to the economy of Alabama coastal communities have been projects related to commercially important species, their life history requirements, habitat losses, management needs, and coastal water quality.

The Sea Lab occupies U.S. surplus property previously utilized for over 100 years for various military facilities, most recently as an Air Force radar base. Island wetland and dune habitats have been altered by various modifications to the site over the years. MESC philosophy has been to minimize any further habitat alterations and to enhance and restore on-site habitats where possible and use these efforts as environmental education for students and the public. A ten-year effort on the south Gulf beach

has resulted in significant recovery of beach vegetation and the coastal slash pine forest. Continuing in this philosophy, MESC is implementing a multi-phased project to provide both indoor and outdoor exhibitry and exposure to native habitats for a combination of formal educational activities and self-guided public participation. In FY 1991-92, MESC initiated Phase I involving site preparation and restoration of altered habitats (wetlands and dunes) on-site.

APPROACH

MESC is restoring approximately 1.5 acres of the north side of the Sea Lab, along the Mobile Bay shoreline to its original wetlands function (see Figure 1). Sand fill placed by the military has been removed to establish intertidal elevations and tidal hydrology. The site includes topography suitable for open water tidal creeks and vegetated wetland (Figure 2). Wetland plants will be transplanted to create cover of approximately 40% *Juncus roemerianus* and 60% *Spartina alterniflora*. This work is being accomplished with state funds, a grant from the U.S. Fish and Wildlife Service, and with engineering and design assistance from the U.S. Army Corps of Engineers, Mobile District.

The restoration site will be used as a demonstration of sound restoration practices and effective evaluation tools. Access by elevated boardwalks and overlooks will allow visitors to monitor all aspects of the habitat and its inhabitants as well as view scientists "in the field" doing applied research. A series of static outdoor exhibits (Phase I) will interpret both the philosophy of wetlands restoration and creation as well as the value and functions of wetlands in general. Real-time data will be displayed from in-situ instruments. Displays documenting the wetland as it historically appeared, as it was altered, under restoration and as it recovers will be updated frequently with photos, and field data in visitor-friendly formats. Displays will acknowledge the contributions of participating agencies.

Subsequent phases of the MESC project include an indoor-interpretive center with aquaria, touch tables, static exhibits and visitor research demonstrations. The habitat restoration research will be further interpreted by allowing center visitors to view actual processing of field samples in a laboratory setting and to discuss the analysis of the progress of wetland recovery with technicians and scientists.

A program of functional assessment and management for restoration success will be implemented to include plant growth, primary production, nekton utilization, nursery species recruitment, avian use, sediment dynamics and hydrology. The restored marsh will be compared to an adjacent reference marsh. Data will be collected using Breder traps (Breder 1960) and weirs (Kneib 1991) for nekton and nursery species and litter bags for benthic recruitment (Rutherford 1989). Planting success and

primary production will be assessed through survival, cover and standing biomass estimates. Bird utilization will be determined by timed censusing. Soil characteristics including particle size and percent organics will be monitored as the ecosystem develops. A sediment-erosion table will be installed to assess the rate of sedimentation (Day and Boumans 1991), and the relative contribution of allocthonous v. autochthonous materials will be compared between the restored and reference marshes. Functional data from the restored marsh will be compared to a similar natural "reference" marsh to assess the extent of success and evaluate development of the restored marsh.

Weirs and sediment-erosion tables will be installed during wetlands construction to minimize impact. Data collection will begin as soon as plant installation is complete and tidal inundation has been restored.

PROJECT ACCOMPLISHMENTS UNDER ADECA PAD-MESC-CAM-92-012

Stipend support was provided for two graduate research assistants to provide technical support for implementation of the Phase I marsh restoration. During the period April 1, 1992 through September 30, 1992, assistance was provided to project design, plant resource protection, and fabrication of monitoring equipment.

The natural reference marsh was utilized to obtain design criteria related to elevations, plant composition, and physiographic features for the restoration marsh. Assistants worked closely with the Mobile District Corps of Engineers through the design phase and subsequently with the contractor during site preparation.

As the site was excavated, existing key wetland and dune plants were removed to a storage nursery for replanting and seed stocks were harvested. Seeds are being maintained in the laboratory for spring 1993 planting.

In preparation for the monitoring effort to follow completion of the restoration effort, assistants acquired materials and constructed four field collection weirs (Kneib 1991), 12 Breeder traps (Breeder 1960), and sampling boardwalks.

PROJECT STATUS

Completion of site preparation and restoration was delayed due to the discovery of a Civil War headstone within the site boundary. Work was halted while a complete Cultural Resources survey was completed.

Dedication of the "Living Marsh" was held October 10, 1992, and Phase I is expected to be completed in early February 1993

(weather permitting). (See enclosed news clippings and announcements.)

SIGNIFICANCE

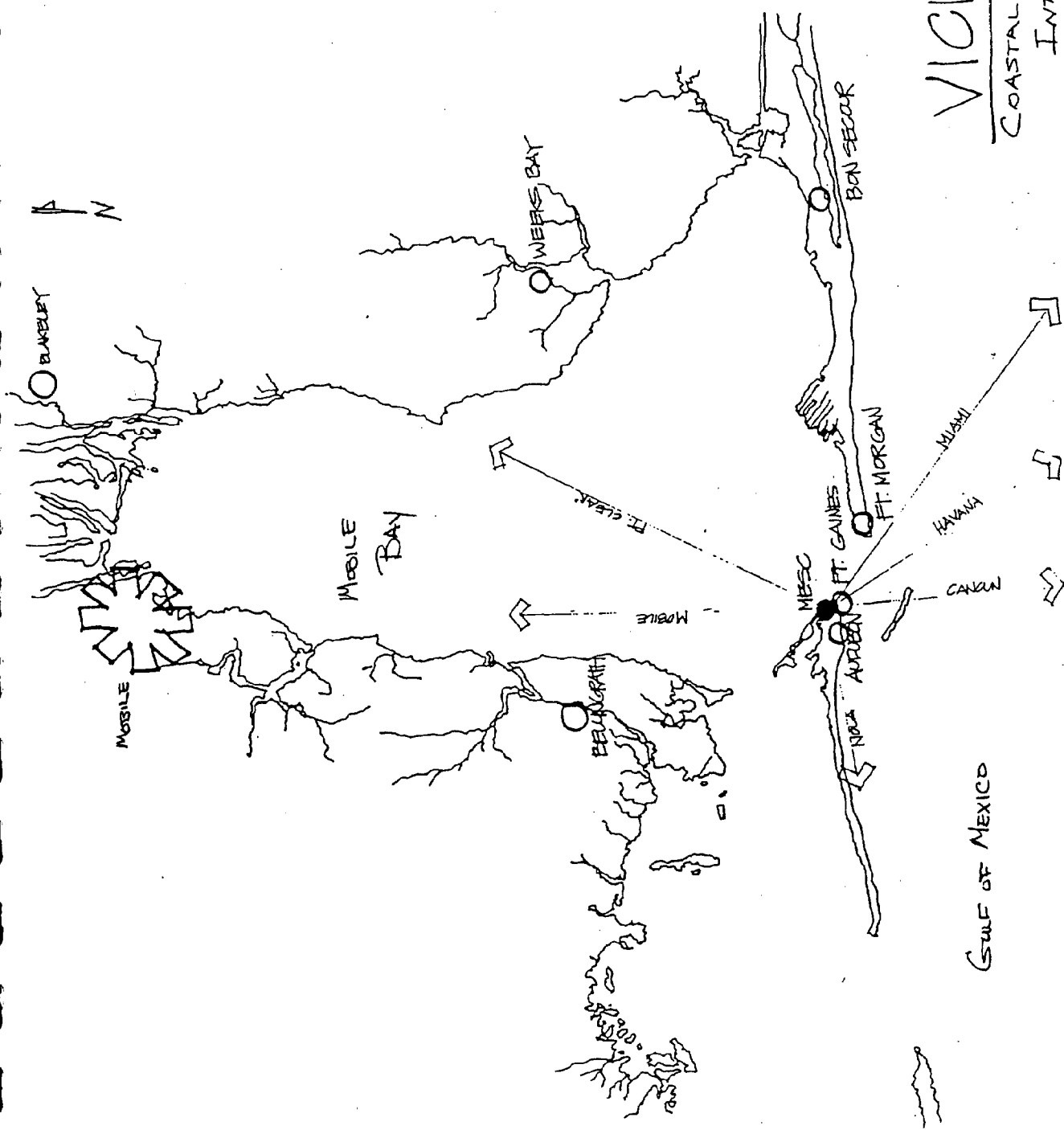
The restoration and monitoring effort has multiple significant science, demonstration, and education components.

- restoration of a former wetland
- concurrent success evaluation
- development of valid but efficient evaluative methods for application in broader restoration efforts
- utilization, as demonstration, of sound design criteria for industry and resource managers
- enhanced public awareness
- access and interpretation during all phases for the public, educational groups, regulators, planners, and developers
- real-time observation of wetlands function and scientific approach by visitor groups

Implementation of wetland restoration at the Sea Lab site (Phase I) offers an ideal opportunity for the development and testing of not only restoration methods but also for assessing various tools to evaluate the functional success of a restored wetland. The location of the restoration site on the campus of a research laboratory provides for more frequent and more intensive observation and data acquisition than is usually possible. Nearby (ca. 1000 m) natural *Juncus* marshes will serve as reference data sources for comparison with functional development of the restored marsh.

References Cited

- Breder, C. M. 1960. Design for a fry trap. *Zoologica* 45:155-160.
- Day, J. and R. Boumans. 1991. The use of sediment fences for wetland creation and restoration in Louisiana. Poster presented at 11th Intl. Estuarine Res. Conf., San Francisco, CA, November 10-14, 1991.
- Kneib, R. T. 1991. Flume weir for quantitative collection of nekton from vegetated intertidal habitats. *Mar. Ecol. Prog. Ser.* 75:29-38.
- Kusler, J. A. and M. E. Kentula (Eds.) 1989. Wetland creation and restoration: the status of the science. U. S. EPA/600/3-89/038.
- Roach, E. r., M. C. Watzin, J. D. Scurry and J. B. Johnson. 1987. Wetland changes in coastal Alabama. pp. 92-101, IN: T. A. Lowery (Ed.), Symposium on the natural resources of the Mobile Bay estuary. Miss.-Ala. Sea Grant Publ. MASG P-87-007.
- Rutherford, S. 1989. Detritus production and epibenthic communities of natural versus salt marshes. M.S. Thesis, San Diego State Univ., San Diego, CA 79 p.
- Tiner, R. W., Jr. 1984. Wetlands of the United States: Current status and recent trends. U. S. Fish Wildl. Serv., Natl. Wetland Inventory. Washington, D.C.



VICINITY MAP COASTAL HABITATS INTERPRETIVE CENTER

Figure 1.

一、
 二、
 三、
 四、
 五、
 六、
 七、
 八、
 九、
 十、
 十一、
 十二、
 十三、
 十四、
 十五、
 十六、
 十七、
 十八、
 十九、
 二十、



Figure 2

New Estuarium will be showcase of state water life

By Justin Fox
News staff writer

DAUPHIN ISLAND — George Crozier has made a name for himself over the years as a defender of Alabama's beaches — and scourge of those who build houses on them or drive on the dunes.

So what is the Dauphin Island Sea Lab director doing promoting a \$4 million waterfront aquarium and educational center that could bring 150,000 tourists to this tiny island every year?

"I'm gambling," Crozier said. "We're going to bring them down here, but I think they're going to leave reasonably well educated and appreciative of the problems" of the coast.

Work is about to start on the first phase of the "Estuarium" — a man-made marsh with a boardwalk from which visitors can see how wetlands work.

After that, if the money flows as Crozier hopes, construction will start on a building that will house aquariums and exhibits.

"I'm worried about the economy," Crozier said. "It's not going to be easy to raise \$3 million from the feds and the private sector."

So far, most of the Estuarium's money has come from the state of Alabama. The local state representative, House Ways and Means Committee Chairman Taylor Harper, D-

Grand Bay, has steered \$1 million in state money to the project.

The federal Environmental Protection Agency and Fish and Wildlife Service together are chipping in \$100,000 to dredge and replant the marsh, which was filled in decades ago.

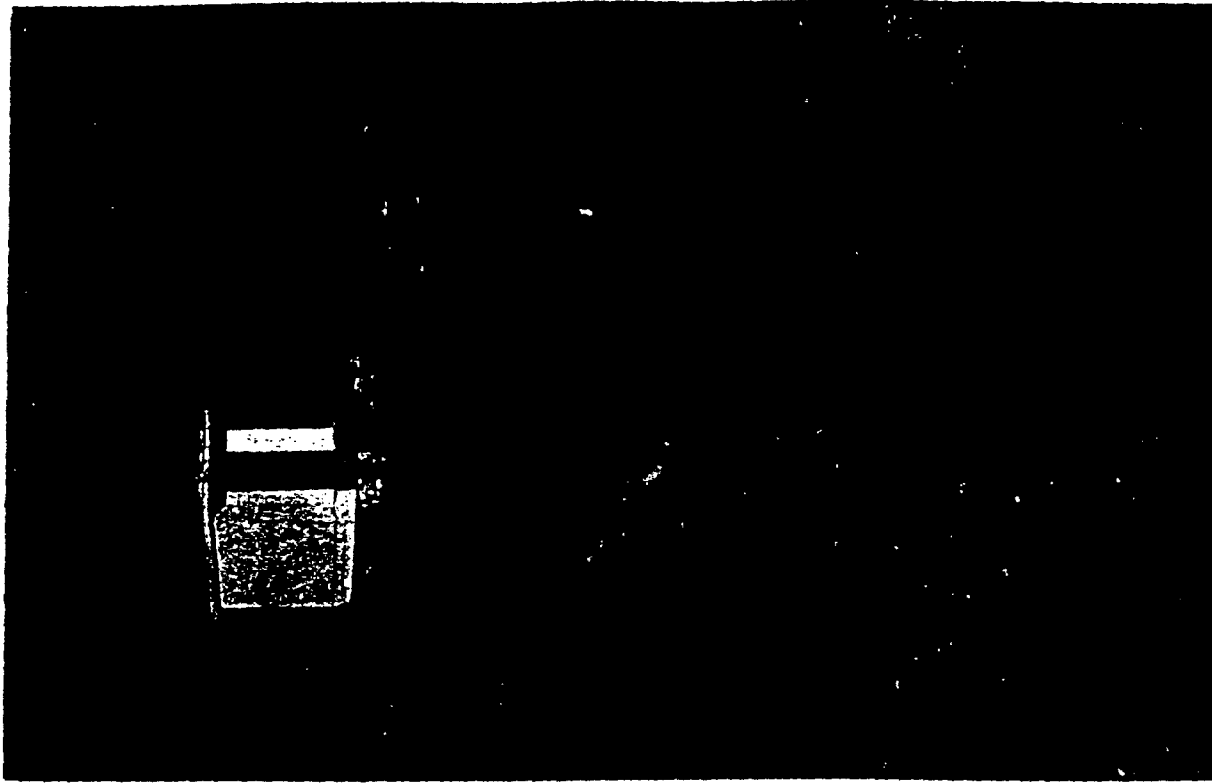
The Estuarium's architects include some of the designers of the Aquarium of the Americas in New Orleans. But the Estuarium will be on a much smaller scale than the New Orleans aquarium and the new Tennessee Aquarium in Chattanooga. It will feature only fish and plants from the Mobile-Tensaw Delta, Mobile Bay and nearby areas of the Gulf of Mexico.

"All this stuff comes from Alabama," Crozier said last week as he showed a visitor a sea-lab tank housing, among other things, a decorator crab, a mantis shrimp and an angler fish — which catches its prey with a lure that protrudes from the middle of its head.

"Nobody believes me, but it all comes from Alabama."

The goal of the Estuarium, Crozier said, is to educate visitors about the richness of area marine life — and about threats to it such as pollution and wetlands destruction. The exhibits will be structured largely for children, who already come to the sea lab by the thousands every

See Estuarium, Page 18A



NEWS STAFF PHOTO/JUSTIN FOX

Dauphin Island Sea Lab Director George Crozier points out where marsh exhibit will be at new Estuarium.

From Page 17A

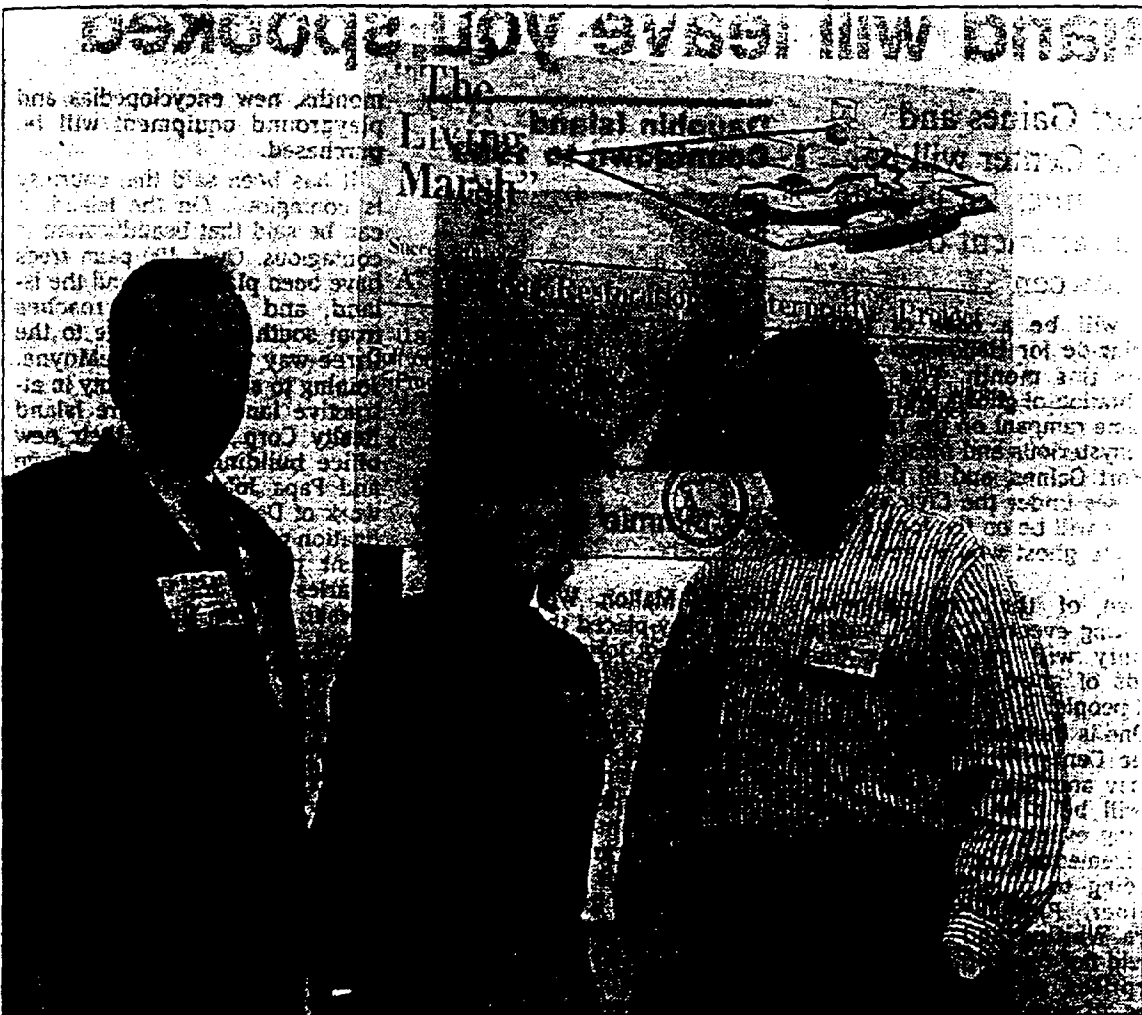
"We've got the tanks; I've got the personnel," Crozier said. "We just need a place to put it."

"They already have got quite a fix-
cilly down there," he said. "It's in a
terrific location... I think their big-
gest problem is how to accommodate
all the people who will want to go
there."

Another worry is hurricanes, which in the past have destroyed homes on the west end of Dauphin Is.

The Estuário will be near Fort Gaines on the bay side of the east end of the island, on land that is about 10 feet above sea level. Greater said the sea-lab buildings "hand-me-downs from an old air base that were built to withstand nuclear attack, weathered Hurricane Frederic in 1979 and Hurricane Elena in 1985" without much damage.

Crutcher said he hopes the Ethel Williams will draw local residents, beachgoers and people of passing interest through South Alabama on Interstate 10 and 95. The sealab already has 30 members, and Williams' summer school is an educational calling card for companies and individuals who will become a part of sealab's environmental program.



U.S. Rep. Sonny Callahan, left, joins State Rep. Taylor Harper, right, and Jane Ladner of Huntsville, in dedicating the first phase of the Estuarium at the Dauphin Island Sea Lab Saturday. The Living Marsh was dedicated in memory of Mrs. Ladner's daughter, Beth, a former student at the Sea Lab who was killed in a car accident in 1991.

EARL SWEATT/Staff photographer

Living Marsh dedicated at Dauphin Island

By EARL SWEATT
Staff Reporter

DAUPHIN ISLAND, Ala. — There were no complaints of "pork barrel" projects Saturday at the Dauphin Island Sea Lab as the new Living Marsh segment of the proposed \$3.5 million Estuarium was dedicated.

U.S. Rep. Sonny Callahan, R-Mobile, along with state Rep. Taylor Harper, D-Grand Bay, and state Sen. Steve Windom, D-Mobile, joined Dr. George Crozier, executive director of the Sea Lab, in dedicating the first phase of the project.

Windom, in addressing guests as they stood in the sand and said spurs across from the Sea Lab offices, said, "For those of you who have complained about pork barrel projects, or don't like them, you are standing in the middle of one right now."

Windom said it was appropriate that Callahan and Harper attended the dedication since it was through their efforts that the project was begun and will become a reality.

"The next project is getting the beach erosion solved," he added.

Crozier said the dedication coincided with the Year of the Gulf and the 50th anniversary of the Gulf of Mexico. He said Taylor was responsible for getting \$500,000 in state funds to begin the project.

"Taylor Harper has been a long-time supporter of our operation on Dauphin Island, and we know he is going to assist us even more in the future," Crozier said.

The Living Marsh was dedicated in the name of a former student at the Sea Lab, Beth Lachner of Huntsville, who was killed in a car accident in 1991. Her parents were on hand for the dedication.

A permanent plaque will be placed at the entrance of the boardwalk leading into and around



Visitors to the Dauphin Island Sea Lab got a close look at one of the aquariums there Saturday.

EARL SWEATT/Staff photographer

the marsh.

The young girl had first come to the Sea Lab program as part of a field trip from Monte Sano Elementary School, Huntsville. She stayed in the program in high school.

After her death, a scholarship was established in her memory for a student from Huntsville High to attend the summer program at Dauphin Island.

Callahan said some of the money for the project will be coming from funds appropriated for the Gulf of Mexico Project, a \$30 million program signed by President Bush.

The funds will be divided by the states bordering the Gulf of Mexico, Callahan said. "This project is a classic example of how federal, state, and city governments can

work together," he added.

Crozier estimated the marsh section will cost approximately \$175,000 and should be completed in about two months.

"It will take about three years for the marsh to actually grow to what it was originally," he said. "The tours will be self-guiding with signs explaining each section."

The site will be the entry to the aquarium and museum area and will offer an interpretive nature trail through the salt marsh. The natural history of the marsh, as well as the mechanisms of recovery, will be presented on story boards along the 500 to 600 feet of elevated boardwalk.

The total Estuarium/Aquarium project will cost approximately

\$3.5 million, Crozier said, of which approximately \$1 million already has been raised. Another \$2.5 million also will be needed to complete the rest of the program. An additional \$1.5 million will be needed for a restoration project of other buildings at the Sea Lab.

"The \$5 million total includes the entire capital development plans for the Sea Lab," Crozier said. He added that some of the funding had been raised through the Environmental Protection Agency and the U.S. Fish and Wildlife Service as part of the "Year of the Gulf" celebration.

The Estuarium/Aquarium is expected to bring tourist dollars to the area and also will be beneficial to the programs at the Sea Lab

By EARL SWEATT

Press Register Reporter

DAUPHIN ISLAND, Ala. — Construction should begin soon on the first phase of the \$3 million Estuarium on Dauphin Island.

Dr. George Crozier, director of the Dauphin Island Sea Lab and coordinator of the planned coastal waters center, said the marsh section of the project will be the first segment constructed.

"We are shooting for an opening in October, just for the marsh section, to coincide with the 500th anniversary of Columbus's discovery of the Gulf of Mexico," Crozier said.

Estuarium, according to Crozier, is Latin for estuary, and will be built around a Mobile Bay theme. Once the entire project is completed, officials estimate, it will attract 150,000 visitors a year to Dauphin Island.

"We have already received \$1 million from the state, thanks to the efforts of (state Rep.) Taylor Harper and the Legislature, and we will be going to the public and private sector for the remainder of the funds," Crozier said.

The estuarium will be a segment of the Marine Environmental Sciences Consortium of the Dauphin Island Sea Lab and will basically be an educational facility.

Crozier said the facility will introduce the basic principles of the ecology of the Mobile-Tensaw River Delta, the Mobile Bay estuarine system, the barrier islands, and the offshore regions to the edge of the continental shelf.

"It will serve as a window into the activities of the lab and its researchers for the general public, and as a hands-on facility and local activity for the students annually utilizing the sea lab facilities."

The estuarium will be located on the north side of Bienville Boulevard across from the sea lab

Crozier said an outdoor aquatic and raised boardwalk will be created amid fresh and saltwater ponds. Sand dunes will form a trail through a natural setting leading to the entrance of the estuarium.

Dr. Judy Stout, marsh ecologist, will be in charge of designing the marsh phase of the project.

Crozier, standing where the marsh will begin, pointing toward a small sand dune, said the marsh once covered that area which will be re-developed. "We will re-create what was once here 40 years ago, before the Federal Cut was made through the marsh," he said.

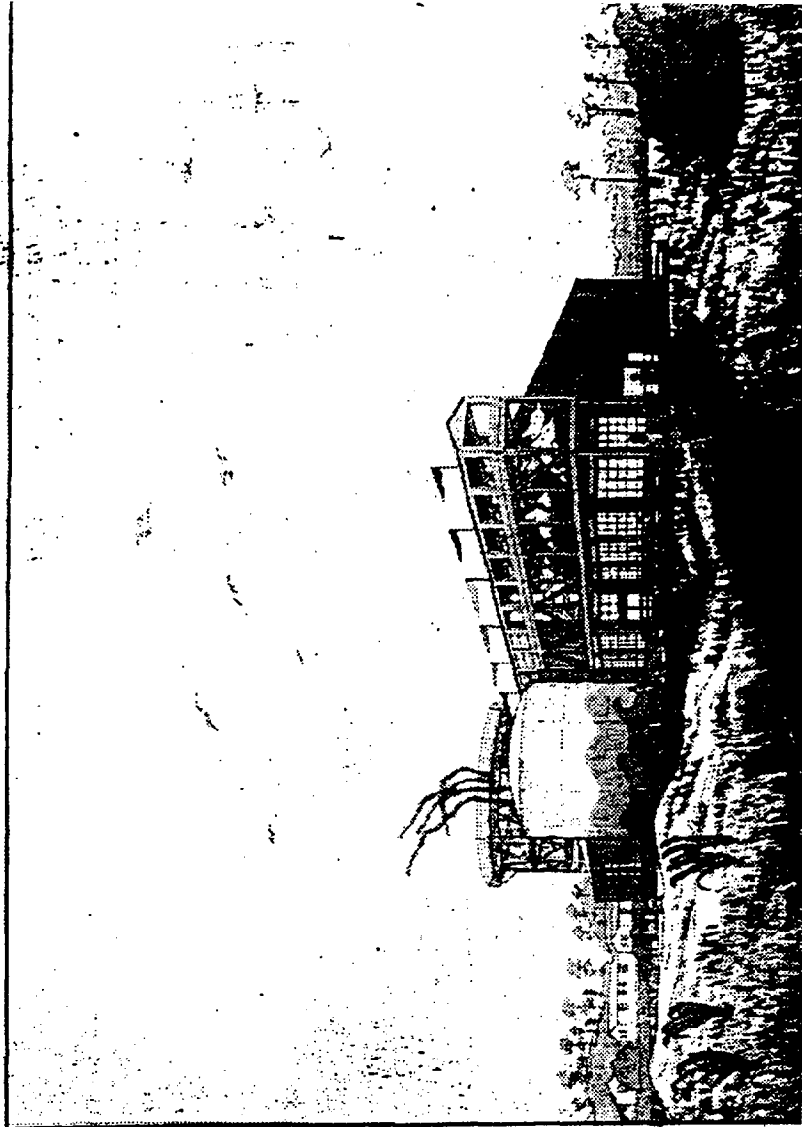
One of the wetlands issues, he added, was whether or not wetlands could be restored. "They can be restored, but to what degree is unknown. Through this project we will be able to record the progress of how the wetlands can be re-turned to what it was previously," Crozier said.

Stout is currently doing research on restoring the marsh and how quickly it recovers and becomes a breeding ground for marine life.

"We will be able to track the progress, follow it with photographs, and be able to show the public this is what it looked like in 1992, and here it is six months, a year, two years, later," he said. As tourists and students walk the boardwalk, they will be able to see the progress.

The effort is to develop a presentation of interactive exhibits combined with live animal capability which does not currently exist in many places in the country.

The architects, the same ones who also built the Aquarium of the Americas in New Orleans, were reportedly happy that the exhibit was dedicated to education first, tourism second.



An artist's rendition of the planned Dauphin Island Estuarium

Crozier said a market study indicated a strong parallel with the Space Camp in Huntsville. Interest is running high in the northern part of the state to promote Huntsville, Gulf Shores and Dauphin Island's Estuarium as a family package vacation.

"They are looking at a half million people," Crozier said of the Huntsville plan.

Plans call for the interior of the Estuarium will focus on the ecology of Mobile Bay and the Gulf of Mexico. Secondary subject matter will be the environmental issues. "We will be showing both sides of the environmental issues," he said. "It will show the harm clear cutting does to the environment

and how Scott's (Paper Co.) helicopter logging operation can benefit the environment."

Each area of the exhibitry will be portrayed with live animal exhibits of key species. The exhibits will include a video presentation showing an overview of Alabama's ecology from the Delta to the Gulf.

Individual displays will include the Delta, Mobile Bay, the barrier islands, the Gulf of Mexico, a touch lab where visitors will be able to touch and handle some marine life, and other displays of marine life.

The touch lab will be housed in a former radar tower. "We will have marine life where the people can actually handle them, and we will show how the food is prepared

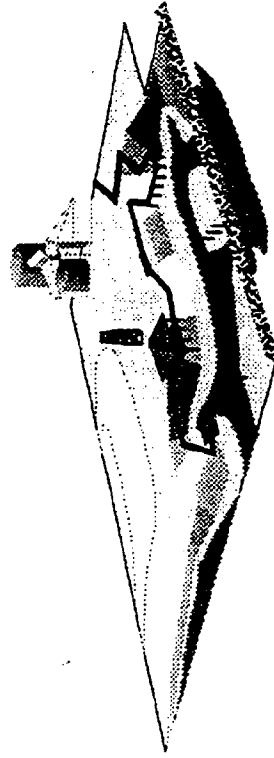
where the marine life is cared and treated," Crozier said.

The entire procedure, from boardwalk over the marsh land the displays and aquariums, showcase the region, show coastal Alabama resources.

Crozier said they have the plan for the land, some of the facilities, about a third of the funds complete the project. "We have been given a \$100,000 from Coastal America, a federal project operated by the EPA, Fish Wildlife and the Corps of Engineers," he said.

Those funds will be used to construct the marsh site.

Dauphin Island Sea Lab



101 Bienville Avenue

Dauphin Island, Alabama

"This coast, However, is disappearing so rapidly that the measures needed to save it are almost at the limits of technology, to say nothing of economics and political will.

And, as with almost all coastal resources, when it is gone, it is gone forever."

- Oliver A. Houck

You are Cordially invited to attend an
OPEN HOUSE
and Ground Breaking for
"THE LIVING MARSH"

the first phase exhibit of the
Dauphin Island Sea Lab's Estuarium.
Dedicated to the memory of

Beth Ladner

and the thousands of acres of tidal wetlands
lost from the Gulf Coast over the last century.

Groundbreaking ceremony - 11:00

Saturday, October 10th 10:00 am

Family & Friends Welcome

Activity Summary: April 1, 1992 - September 30, 1992
Marsh Restoration Project (ADECA No. PED-MESC-CZM-92-012)
By: Marine Environmental Sciences Consortium (J. Stout)

Stipend support was provided for two graduate research assistants to provide technical support for implementation of a marsh restoration project on Dauphin Island, AL. The completed project will be a portion of an outdoor public educational program on coastal habitats and ecology. In preparation for designing, installing, and monitoring the functional evolution of the restored 2.5 acre salt marsh, graduate assistants performed the following tasks.

1. Survey of natural reference marsh to provide specifications for restoration design.
2. Consulted with architects and engineers during design phase.
3. Located, monitored for maturity, harvested, and maintained seed collections of Spartina alterniflora and Uniola paniculata for planting in the restored marsh.
4. Salvaged and maintained in a nursery, plants subject to destruction during site preparation.
5. Acquisition of supplies and equipment and fabrication of sampling gear and field collection weirs.
6. Coordination of site preparation with contractor.

QUARTERLY REPORT: OCTOBER 1, 1992 - DECEMBER 31, 1992

AGS Subcontract No. 93C035304

By: Marine Environmental Sciences Consortium, Dr. Judy Stout

A graduate research assistant was hired to assist with the project. During the reporting period, staff have compiled locally available documents, maps, data bases and other materials related to the tasks within the scope of work. A task-specific data base of documents has been initiated.

"The Living Marsh"

Ground Breaking Ceremony

11:00 a.m.

*Dedicated to the memory of Beth Ladner
and the thousands of acres of tidal wetlands
lost from the gulf coast over the last century.*

Beth Ladner

Beth Ladner was one of those students that change teachers' lives. She first came to programs at the Sea Lab as part of a field trip from Monte Sano Elementary School in Huntsville. She continued her involvement through the Discovery Hall Program, both in the summer institute and field trips from Huntsville High School. Her tragic death in a car accident in 1991 was felt throughout her world. In Beth's memory, a scholarship fund has been established for a student from Huntsville High to attend the Summer Program. The faculty of the school select the recipient on the basis of their traits of enthusiasm, leadership and friendship that Beth displayed.

The restoration of this marsh site and the educational programs which will be designed around it are dedicated in her name. It is hoped that the exhibit will somehow capture the spark and spirit that Beth always brought to the Sea Lab.

The Lost Wetlands

Since the middle of this century alone, almost 7,000 acres of nonfresh marsh have disappeared from the environs of Mobile Bay. The causes are industrial/navigation development, erosion/subsidence and/or natural succession. Over the last two decades, the rate of loss attributable to the first mechanism has slowed and efforts at replacement and restoration have evolved - slowly!

The scientists at the Dauphin Island Sea Lab and the Mobile District of the U.S. Army Corps of Engineers have designed a restoration project which will transform a septic tank field into a natural estuarine marsh. The site will be the entry to the aquarium/museum and will offer an interpretive nature trail through the salt marsh. The natural history of the marsh, as well as the mechanisms of recovery, will be presented on story boards along an elevated boardwalk. The cultural history of the site will also be reviewed for the visitor.

The Environmental Protection Agency and the U.S. Fish and Wildlife Service have provided partial funding for the project as part of the "Year of the Gulf" celebration.



Open House

October 10, 1992

10:00 a.m. - 3:00 p.m.



Reception Site - Administration (1): The lobby of the administration building will be the check-in site. Students from the Discovery Hall Program will serve as host personnel for the Open House.

Displays presenting the plans and potential of the Estuarium are available for viewing. Of special interest is the "hard-bottom" tank featuring several rare animals, including deep-water butterfly fish and a moray eel previously unreported from the Gulf of Mexico.

The Sea Lab Bookstore/Gift Shop, located in the administration building, will be open from 10:00 a.m. until 3:00 p.m.

Discovery Hall (7): The faculty of Discovery Hall are presenting their "touch lab" in Discovery Hall. You have an opportunity to handle some of the material they use routinely with school groups and become familiar with some of the wonders of our coast.

Hospitality Area - Horizon (8): Visitors may relax under Horizon Hall at the south side of the campus. Refreshments and information packages are available. There will also be a slide presentation of activities at the Sea Lab.

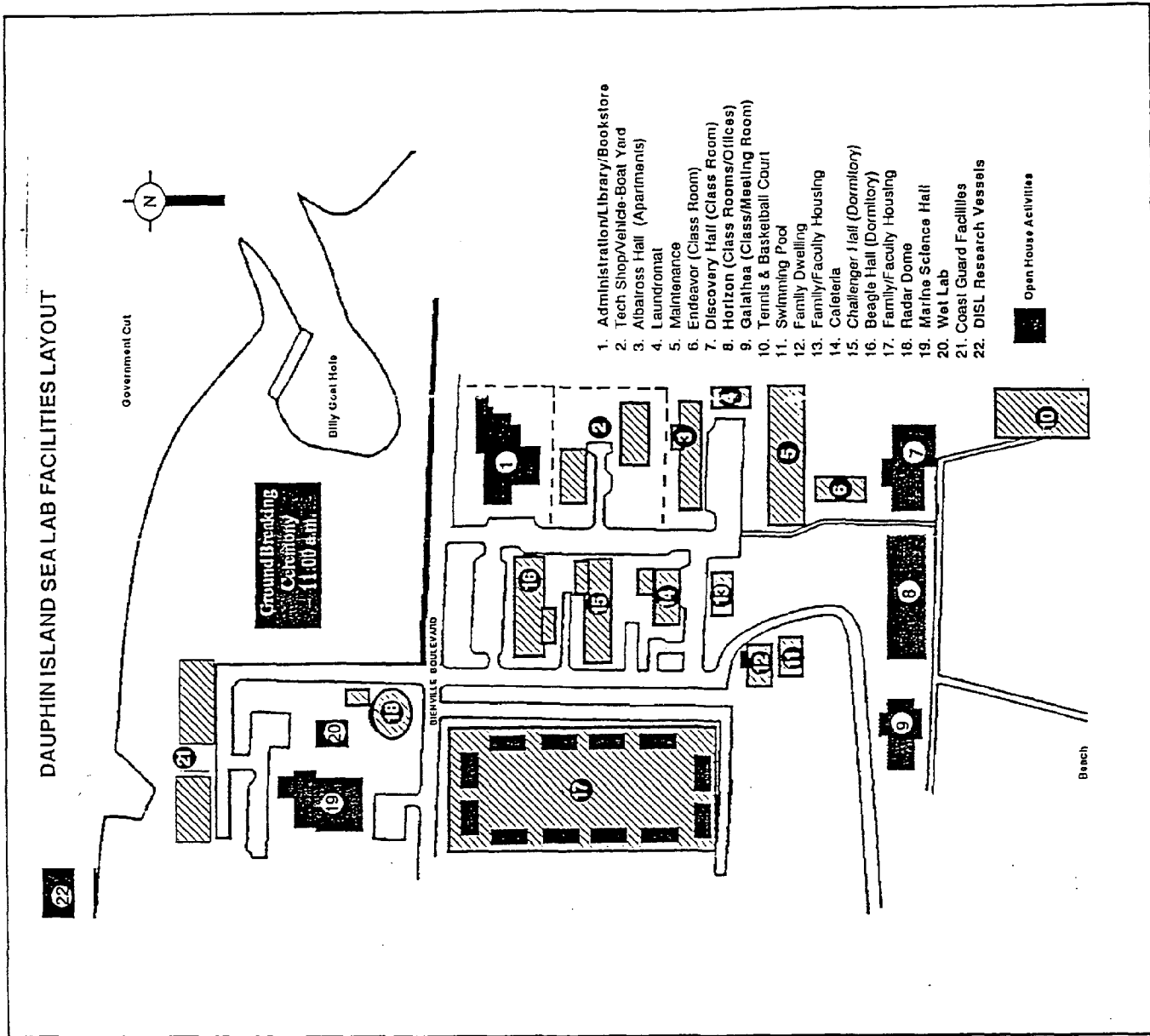
Classrooms used in the K-12 programs of Discovery Hall and college programs are open for viewing. Specimens of marine animals commonly encountered on Alabama's coast are on display.

Video Presentations (9): Each hour, on the hour, there will be a video shown in Galathea Hall.

Marine Science Hall (19): The research faculty have arranged a number of displays explaining their programs at the Sea Lab, including studies of sea grass recovery and nutrient enrichment of Mobile Bay.

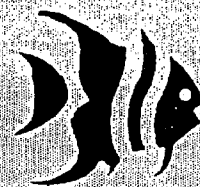
Wet Lab (20): Staff from the Estuarium have arranged a number of display tanks featuring organisms from the coastal area including sting rays, an electric ray and many others. A poster display on studies of oyster biology is set up in the wet lab.

R.V. A.E. Verrill (22): Visit the 65' research vessel of the Sea Lab and get a look at some of the equipment that is employed by oceanographers and marine biologists. Technical support personnel from the Lab will be available to demonstrate the gear and answer questions.



Tidings

from: *Dauphin Island Sea Lab*

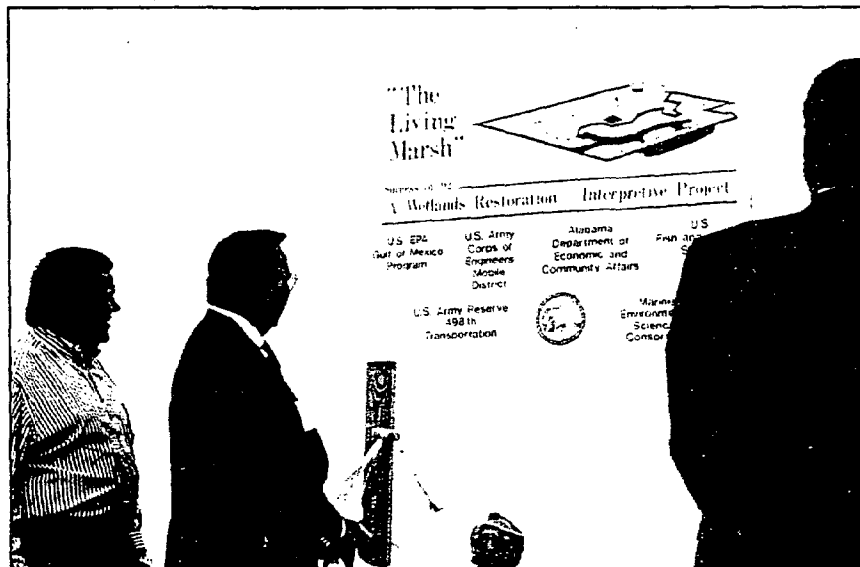


Dauphin Island, Alabama

Summer, Fall 1992

Vol. 6, No. 1

The newsletter of the Marine Environmental Sciences Consortium



Representative Taylor Harper (left) and Congressman Sonny Callahan view "The Living Marsh" display board at the dedication ceremony held in October.

Sea Lab Dedicates "The Living Marsh"

Congressman Sonny Callahan joined officials from the EPA Gulf of Mexico Program, the Corps of Engineers, ADECA and the U.S. Fish and Wildlife Service at the ground breaking ceremony for the marsh restoration project held October 10. Dr. Joe Thomas, Vice President for Academic Affairs and Provost at UNA and Chairman of MESCC's Executive Committee, represented the consortium and Sen. Steve Windom joined Rep. Taylor Harper in dedicating the project to Beth Ladner. Beth, a talented and active participant in the Sea Lab's Discovery Hall Program, died tragically in an automobile accident in 1991. Beth's parents were present to take part in the ceremony.

The first phase of the project will restore about two acres of natural tidal marsh to an area that had been converted to a septic field. The site will be the entry to the Estuarium and will have an interpretive nature trail through the salt marsh. The natural functions of tidal salt marshes and the cultural history of the area around Fort Gaines will be presented on story boards along boardwalks. It will take an estimated three years for the marsh to return to its original condition.

The construction contract for the project has been awarded to J. F. Pate General Contractor.

21st Annual Benthic Ecology Meetings Planned

The 1993 Benthic Ecology Meetings will be held April 1-4, 1993 at the Riverview Plaza -A Stouffer Hotel- in Mobile, AL. The University of South Alabama and Dauphin Island Sea Lab will co-sponsor the meetings next spring. If you would like more information please contact Drs. Loren Coen, Ken Heck or John Valentine (205) 861-2141.



Governor Hunt Visits Sea Lab

Governor Guy Hunt became the first governor to visit the Dauphin Island Sea Lab. The governor viewed the model of the Estuarium as Dr. George Crozier explained the educational benefits the new construction would bring to the local public and tourist. Before his departure the governor joined Dauphin Island's Mayor, Doris Anderson, in planting a palm tree in front of the administration building.



The rocky, macroalgal dominated coastline of Maine.

Field Marine Science Course Goes to Maine

In September, 12 graduate and undergraduate students, enrolled in the fall Field Marine Science course offered by Drs. Kenneth Heck and John Valentine, caravanned to the Ira Darling Center in Walpole, Maine. The selection of Maine for the class study site provided many of the students with their first opportunity to compare and contrast a rocky, macroalgae dominated coastline which has tidal ranges in excess of 10 feet with the marsh dominated gulf coast where tidal ranges seldom exceed 3 feet.

Students were treated to lectures by University of Maine faculty members Drs. Robert Steneck and Les Watling. Students also had the unique opportunity to attend a seminar presented by Dr. George Branch of the University of South Africa. Class participants also took part in a trawling and dredging cruise on the Damariscotta River where collections provided a glimpse of the common fauna, including American lobsters and sea scallops.

During the ten day visit, students were very busy with classroom discussions of scientific papers and individual projects. Projects ranged from the role of nutrients in controlling macroalgal productivity to the influence of green crab prey selectivity on the age distributions of blue mussels along an intertidal gradient.

May's Cookbook is Here!

TRIBUTE – To The Great Cooks of the Dauphin Island Sea Lab

After years in preparation, May Tillman's cookbook, featuring recipes, stories and pictures from the Sea Lab is available. The early history of the lab is delightfully told by both May and Dr. Crozier. Great gift and memento of the Lab - and a good cookbook. \$17.95, plus \$2.50 postage and handling each book. Alabama residents add \$1.26 sales tax, each book. To order send check and return address to: May Tillman, P.O. Box 316, Dauphin Island, AL 36528.

School of Science and Math Initiate Archaeological Survey

The headstone for the grave of Michael Carter triggered a concern for the "cultural" history of the Estuarium site. A Corps of Engineers archaeological team examined the area in detail and issued a report which was unremarkable. The area had been severely altered by the Air Force when the septic field was constructed. Useful historical information was provided for the story line planned for the exhibit.

Alabama Science Teacher Conference Attended

ASTA held its fourteenth annual statewide science teachers conference in Birmingham, Alabama from Sept. 10-12. Jenny Cook, Hazel Wilson and John DiPlacido conducted workshops and attended sessions. ASTA provides a vital network for science educators.

SEA LAB NEWS/ COMMUNITY AFFAIRS

At the end of the summer session, Dr. Will Schroeder was honored by Dr. Judy Stout for surviving 20 consecutive years of teaching oceanography during the summer session.

George and Jennifer McManus are the proud parents of Pierce Martin. Their son was born October 22 weighing 8 lbs. 7 oz. Congratulations.

We welcome Dana Roberts and Casey Harrison to the Sea Lab family. Dana and Casey are instructors for the Discovery Hall Program.

News of MESC Graduate Students

Schreiber Receives Sea Grant Marine Policy Fellowship

Ramona Schreiber (M.S., University of Alabama) has been awarded one of the 1993 Dean John A. Knauss Marine Policy Fellowships administered through the Sea Grant Program. This fellowship will allow her to spend one year in Washington, D.C. working and learning about policy related issues as they affect the marine environment. Ramona follows in the footsteps of MESC students Marc Wilson and Laurie Sullivan who have also participated in the program. Dr. Jim Jones at the Mississippi-Alabama Sea Grant Consortium is responsible for nominating individual applicants and overseeing the progress of the students in the fellowship program.

Pennock and Students Attend Gulf Coast Geochemistry Group Meeting

Dr. Jonathan Pennock and students Ramona Schreiber, Felix Fernandez, Jean Cowan and Skeet Loes attended a meeting of the Gulf Coast Geochemistry Group hosted by the Oceanography Department at Florida State University in October. This informal meeting is designed to bring marine/aquatic scientists together to discuss their research on the Gulf Coast. Jon presented an overview of programs at the MESC as well as an overview of nutrient cycling in Mobile Bay and near coastal waters. As a result of their participation, MESC was asked to host the next meeting at the Sea Lab in the fall of 1993.

Dr. Bob Shipp Honored

Bob Shipp, faculty and former Acting Director of MESC was honored as the USA College of Arts and Sciences Dean's Lecturer. He is the 11th faculty member so recognized since 1982.

He has authored about thirty scientific papers on Gulf and Atlantic fishes, and directed about twenty masters theses on marine fishes. Five of his students have gone on to complete doctoral programs. He is author of "Dr. Bob Shipp's Guide to Fishes of the Gulf of Mexico" now in its third printing.

Recently, the Secretary of Commerce appointed Bob to represent Alabama on the Gulf of Mexico Fisheries Management Council, the decisions of which carry the force of Federal law regarding marine resource regulations. He also chairs the MARFIN Council, which administers \$4.5 million annually to marine researchers along the Gulf of Mexico and South Atlantic coasts.

Dr. Shipp's research focuses on marine fish populations, their evolution, ecology, and distribution with special interest in reef fish communities.

Graduate Course Schedule (Quarter Hours)

1993/94

Fall-

Physical Oceanography (6)
Marine Ecology (6)
Marine Biogeochemistry (3)
Advanced Topics in Oceanography: Global Change (3)

Winter-

Chemical Oceanography (6)
Seagrass Ecosystem Ecology (3)
Marine Resource Management (3)
Zooplankton

Spring-

Biological Oceanography (6)
Field Marine Science - Florida Keys (3)
Quantitative Methods
Benthic Ecology (4)
Marine Animal Physiology

1994/95

Physical Oceanography (6)
Marine Ecology (6)
Oceanology of the Gulf of Mexico
Phytoplankton Ecology and Physiology (3)
Field Marine Science - North Atlantic (3)

Chemical Oceanography (6)
Marine Resource Management (3)
Marine Zoogeography (6)
Physical Processes in the Coastal Ocean (3)

Biological Oceanography (6)
Phytoplankton Ecology & Physiology (3)
Fisheries Oceanography
Marine Analytical Instrumentation (3)
Fish Physiology

BAYWATCH Goes into the Schools

John DiPlacido and Dr. Crozier are demonstrating the citizen monitoring protocols to schools in the coastal area. The middle school class at the Gulf Shores School had already begun work in the Weeks Bay Reserve and eagerly adopted the new sampling exercise. At the other end of the bay, the Adams Middle School in Saraland initiated a monitoring site on Bayou Sara, one of the tidal streams leading into the Delta.

The BAYWATCH program in schools is more oriented toward the educational and student awareness objectives than true trends analysis, but the data will be utilized if it bears up under QA/QC scrutiny. The schools are also excited about using their computer labs to analyze the data and communicate with each other.



Students and teachers of Adams Middle School listen as John DiPlacido and Dr. Crozier explain the BAYWATCH Program.



Drs. Jon Pennock and Will Schroeder in front of the statue of Sir Francis Drake. Drake departed Plymouth, England on the historic voyage in which he circumnavigated the globe.

Pennock and Schroeder Attend Estuarine Sciences Meeting

Drs. Jonathan Pennock and Will Schroeder presented papers at the joint meeting of the European Estuarine and Coastal Sciences Association (ECSA) and the Estuarine Research Federation (ERF) in Plymouth, England in mid-September. The meetings brought together estuarine researchers from Europe and the United States to discuss their research findings and directions. Jon presented results factors controlling the expression of eutrophication in estuaries, while Will discussed the role that storm events play in shaping estuaries. In addition to the presentations, participants were treated to a cruise on the Tamar Estuary and a tour through the Plymouth Marine Laboratory.

ESEA Honors Discovery Hall Program

At the National Elementary/Secondary Education Act, the Dauphin Island Sea Lab's Marine Science for Teachers was identified as exemplary by a consultant from the U.S. Department of Education during a review in August 1991. Wayne Teague, State Superintendent of Education, congratulated the teachers and staff involved in the program for their hard work, enthusiasm and dedication to quality teaching in Alabama's schools.

Tidings newsletter is produced by the Marine Environmental Sciences Consortium, P.O. Box 369-370, Dauphin Island, AL 36528, and is available free of charge. Correspondence and address corrections should be directed to its editor, Lynn Bryant, or phone (205) 861-2141. Fax number (205) 861-4646.

Professional Conferences and Meetings

Coen, L. D., C. E. Tanner and N. M. Targett. "Form variation in a tropical marine alga: consequences of differential grazing pressure among habitats and herbivores." Ecological Society America Meetings, Honolulu, Hawaii. Bull. Ecol. Soc. 73:142. (Aug. 1992):

Coen, L. D. and K. L. Heck. "Evaluation of quahog (*Mercenaria mercenaria*) abundance and growth inshore Alabama and northwestern Florida waters: an assessment of favorability for clam culture. Fifth Annual MARFIN Conference, Corpus Christi, TX (Oct. 1992).

Heck, K. L. and D. A. Nadeau. "The relative value of vegetated habitats to juvenile red drum and spotted seatrout." National Marine Fisheries Service, MARFIN Conference, Corpus Christi, TX (Oct. 1992).

Pennock, J. R. "Nutrient Dynamics in Mobile Bay and Near-Coastal Waters." Gulf Coast Geochemistry Group Meeting, Tallahassee, FL (1992).

Pennock, J. R., J. H. Sharp, W. W. Schroeder. "What controls the expression of estuarine eutrophication? - Case studies of nutrient enrichment and phytoplankton production from the Delaware Bay and Mobile Bay estuaries, USA." Joint Estuarine and Coastal Sciences Association/Estuarine Research Federation Meeting, Plymouth, England. (Sept. 1992).

Schroeder, W. W., S. Douglass and W. Isphording. "Storm events: their role in shaping estuaries." Joint Estuarine and Coastal Sciences Association/Estuarine Research Federation Meeting, Plymouth, England. (Sept. 1992).

Recent Publications

Gittings, S. R., T. J. Bright, W. W. Schroeder, W. W. Sager, J. S. Laswell and R. Rezak. 1992. Invertebrate Assemblages and Ecological Controls on Topographic Features in the Northeast Gulf of Mexico. Bulletin of marine Science 50(3):435-455.

Mars, J. C., A. W. Shultz and W. W. Schroeder. 1992. Stratigraphy and Holocene Evolution of Mobile Bay in Southwestern Alabama. Transactions - Gulf Coast Association of Geological Societies. Vol. XLII, pp. 529-542.

Targett, N. M., L. D. Coen, A. A. Boettcher and C. E. Tanner. 1992. Biogeographic Comparisons of Marine Algal Polyphenolics: Evidence Against a Latitudinal Trend. Oecologia (Berl.) 89:464-470.

New Grants Received

U.S. EPA.- "Coastal Submerged Aquatic Vegetation Initiative." K. L. Heck, L. D. Coen, J. R. Pennock, J. Valentine. 1992/1993. \$32,000.

NSF-EPSCoR -- "Physical and biogeochemical regulation of production and community metabolism in a coastal embayment." J. R. Pennock, W. W. Schroeder. 1992-1995. \$296,177.

Fall Colloquium Speakers

Dr. Ken Brown, LSU, "Complex Interactions in freshwater Lake Food Webs."

Dr. Don Potts, Univ. Calif. Santa Cruz and Smithsonian Institution, "Divergent speciation rates in Atlantic and Pacific corals."

Dr. David Millie, USDA-New Orleans, "Algal Pigments and Remote Sensing: an Organismal and System Perspective."

Schroeder Speaks at Dolphin Symposium

Dr. Will Schroeder was invited by the Alabama Conservancy to present the opening talk at the recent public symposium entitled "The Dolphins of the Northeastern Gulf of Mexico and their Environment." His topic was "An Overview of the Abiotic Characteristics of the Northeastern Gulf of Mexico." He focussed on air and water temperature data collected by the Sea Lab on the east end of Dauphin Island over the past 18 years, as well as historical data sets of Atlantic tropical storms and local river discharges to illustrate climatic trends and the degree of regional variability.

Fox Visits Lab

Dr. Sydney Fox, an expert on the inorganic synthesis of biological macro-molecules, was given a tour of the Sea Lab facilities by Dr. George McManus in October. Visiting from the University of Southern Illinois, Dr. Fox gave a seminar at the University of South Alabama.



Matt Williams relocates sea oats for the "living marsh" exhibit.

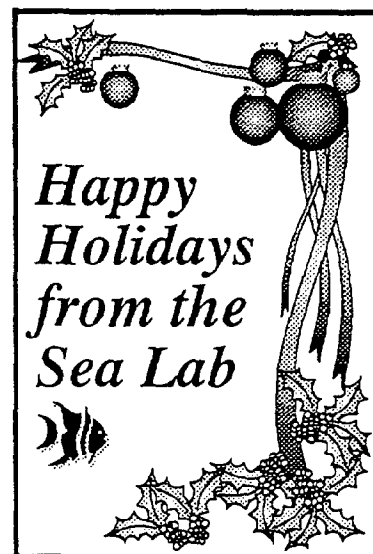
Marsh Restoration Begins

Matt Williams, one of the Sea Lab graduate students from the University of South Alabama, turns the soil under the first batch of sea oats to be relocated. One of the key stories in the construction of the "living marsh" exhibit is the tracking of the evolution of natural processes associated with the reconstruction of the system. The northern edge of the site already has some natural marsh elements and those are to be undisturbed by the construction activities.

The contractor will lower the elevation of the land just south of the fringing marsh and Dr. Stout's team will construct weirs to control water levels in the site during the planting phase which will begin in the late winter. A number of experimental configurations will be pursued and the site will be equipped with a number of remote monitoring instruments. The readouts will be available for the general public to view as part of the displays under the pavilion.

Chemosynthetic Community Study Continues

Dr. Will Schroeder participated in his second summer cruise in the northern Gulf of Mexico investigating chemosynthetic communities in August. This research is being conducted by the Geochemical and Environmental Research Group of Texas A & M University and is sponsored by the Minerals Management Service of the Department of Commerce.



Marine Environmental Sciences Consortium
Dauphin Island Sea Lab
P.O. Box 369-370
Dauphin Island, AL 36528



Bulk Rate
U.S. Postage
PAID
Permit No. 4
Dauphin Island
Alabama
36528

"The Living Marsh - Sword to Plowshare"

The tidal marshes of the north-central Gulf of Mexico are dominated by two grasses - smooth cordgrass near the water's edge and black needlerush just above the high tide line. Like all tidal marshes, these areas are known to be functional nurseries, providing both food and protection to its varied inhabitants. But quantitative assessments of the users are rare and the gradual invasion of "new" areas has never been studied in detail.

The natural marsh has been restored within an area which had been completely altered to provide septic tank treatment for the former Air Force base now occupied by the consortium of colleges and universities which operate the Dauphin Island Sea Lab. The wooden structures seen at the edge of the marsh are experimental "weirs" designed to trap animals who enter the marsh at high tide. Removable mesh panels are inserted at high tide to enclose an area of 25 square meters. The organisms thus captured are then measured. As the natural marsh matures we expect the nature of the animal population to reflect that evolution. The experiment will also yield valuable data with regard to the economic potential of restored marshes in terms of living resources.

Data from the "new" marsh will be compared to similar efforts in the natural marsh near the ferry landing. The functional recovery of these reconstructions has long been questioned in the technical community and these experiments are designed to address that management issue.

NOAA COASTAL SERVICES CENTER LIBRARY



3 6668 14104 8209

